Pt. No. 948753 9/74

Operating Instructions for AMPROBE®

Model AM-3 Industrial Multimeter

AMPROBE INSTRUMENT®
DIVISION OF SOS CONSOLIDATED INC., LYNBROOK, NEW YORK 11563

SPECIFICATIONS

Voltage Ranges

0-30/150/300/750VAC	10,000 ohms/volt
0-3/30/150/300VDC	100,000 ohms/volt

Resistance Ranges

0-500 ohms	with 5 ohms midscale
0-5,000 ohms	with 50 ohms midscale
0-50,000 ohms	with 500 ohms midscale
0-5 megohms	with 50,000 ohms midscale

Current Ranges

0-10uA See page 5 DC Current Measurement
0-15/150uA DC at 300mV
0-1.5/150mA DC at 300mV
0-5/25/100/250 Amperes AC See Note 1, page 2
0-0.5/1.0/2.5/10 Amperes AC See Note 1A, page 2
0-50/1000/1200 Amperes AC See Note 1B, page 2
0-1250/5000/6000 Amperes AC See Note 1C, page 2
0-10/50/250/500 Amperes AC See Note 2, page 2
0-1/2/5 Amperes AC See Note 2A, page 2
0-100/1200 Amperes AC See Note 2B, page 2
0-2500/6000 Amperes AC See Note 2C, page 2

Millivolt Ranges

0-75/750/1500mV DC at 10uA
0-300mV DC See page 4 DC Voltage Measurement

Temperature Ranges

Low: -10°F to +250°F See Note 3, page 2
High: +70°F to +1200°F See Note 4, page 2

Accuracy

DC ±3%F.S.
VAC ±4%F.S.
Amperes AC ±5%F.S.

Ohmmeter ± 3% of Arc
Low Temperature ±3% of Arc*
High Temperature ± 3%F.S.*
*Including temperature probe

Ohmmeter Power Supply

Uses 2 "C" batteries in parallel

Circuit Protection

Instrument uses 1 #8AG-361 1 Amp Fast Blow (Littelfuse)
1 #3AG-312 0.1 Amp Fast Blow (Littelfuse)
Do not use substitute fuses as resistance can vary, see page 9.

**Note 1: This range capability is available through the use of an accessory current transducer Model A603 for 60Hz current or Model A653 for 50Hz. current.

**Note 1A: This range capability is available through the use of the Energizer Model A45-L or A45-CL, in conjunction with the A603 or A653.

**Note 1B: This range capability is available through the use of the Deca-Tran Model A50-1 in conjunction with the A603 or A653.

**Note 1C: This range capability is available through the use of the Amptran Model CT-50 in conjunction with the A603 or A653.

**Note 2: This range capability is available through the use of an accessory current transducer Model A703 for 60Hz. current and Model A753 for 50Hz. current.

**Note 2A: This range capability is available through the use of the Energizer Model A45-L or A45CL, in conjunction with the A703 or A753.

**Note 2B: This range capability is available through the use of the Deca-Tran Model A50-1 in conjunction with the A703 or A753.

**Note 2C: This range capability is available through the use of the Amptran Model CT-50 in conjunction with the A703 or A753.

**Note 3: This range capability is available through the use of an accessory temperature probe Model RBT-11 Immersion Probe, Model RBT-12 Universal Probe or Model RBT-13 Vented Air Probe (all for noncorrosive applications). RBT-13 Probe should not be used in temperatures above 150°F.

**Note 4: This range capability is available through the use of an accessory temperature probe Model TC-3.

**Accessory is not supplied with the Basic AM-3 instrument.

For Factory service, package instrument and packing slip with sufficient cushioning material in a shipping carton; make certain your name and address also appear on box as well as packing slip; ship prepaid via U.P.S. (where available) or Air Parcel Post insured to Service Division, AMPROBE INSTRUMENT, 630 Merrick Rd., Lynbrook, N.Y. 11563. U.S.A. Outside of the U.S.A. contact the factory or the local AMPROBE representative.

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PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION

1) Before using any electrical instrument or tester for actual testing, the unit should be checked on a known live circuit to make certain it is operating properly.
2) Before applying test leads to circuit under test, make certain:
   a) Test leads are plugged into proper instrument jacks observing proper polairty and
   b) Selector switch is set to proper range.

ACCURACY

1) For greatest accuracy, the pointer should be set on the zero line. Use zero adjusting screw, if necessary.
2) When using meter, place it panel side up on a flat non-metallic surface.
3) Take a reading on the range on which the reading is as close to full scale as possible.

OPERATION

Before using instrument read "Precautions for Personal and Instrument Protection" above.

DC/AC Voltage Ranges

All voltage measurements are read on the 15/30/75 scale and an appropriate multiplying or dividing factor applied (see paragraph 6 AC Voltage and DC Voltage Measurement below) when the selector switch is set on a range other than those appearing on the scale.

AC Voltage Measurement

1) Set the selector switch to appropriate AC voltage range. When voltage is unknown, use the highest voltage range.
2) Plug the Black test lead into the "-" jack.
3) Plug the Red test lead into the "+" jack.
4) Place one test prod on each side of the AC voltage.
5) If meter indication is in lower half of scale and falls within the range of a lower scale, reset selector switch to the lower range.

6) Range VAC	Read on Scale	Multiply (x) Reading By
0-30	0-30	x1
0-150	0-15	x10
0-300	0-30	x10
0-750	0-75	x10

DC Voltage Measurement

1) Set the selector switch to appropriate DC voltage range. When voltage is unknown, use the highest voltage range.
2) Plug the Black test lead into the "-" jack.
3) Plug the Red test lead into the "+" jack.

4) If Negative and Positive sides of the circuit to be tested are known:
   a) connect the Black test prod to the Negative side of the circuit.
   b) connect the Red test prod to the Positive side of the circuit.
   If the Negative and Positive sides of the circuit are not known:
   a) connect the Black and Red prods to the circuit.
   b) if meter deflects to the left reverse the Black and Red prods.
5) If meter indication is in lower half of scale and falls within the range of a lower scale, reset selector switch to the lower range.

6) Range	Read on Scale	Multiply (x) Or Divide (÷) Reading By
0-3VDC	0-30	÷10
0-30VDC	0-30	x 1
0-150VDC	0-15	x10
0-300VDC	0-30	x10
0-75mV	0-75	x 1
0-300mV*	0-30	x10
0-750mV	0-75	x10
0-1500mV	0-15	x100

*This range is achieved by setting the range selector switch to the 0-15uA range, take readings on 0-30 scale and multiply by 10.

AC/DC CURRENT MEASUREMENTS

DC Current Measurement

A millampere is one thousandth (1/1000) of an ampere and may be written as 1 mA or 0.001 ampere.

A microampere is one millionth (1/1,000,000) of an ampere and may be written as 1 uA or 0.000 001 ampere.

Meter must be connected in series with the circuit under test.

All DC current measurements are read on the 15/30/75 scale and an appropriate multiplying or dividing factor (see paragraph 7 below) applied, when the selector switch is set on a range other than those appearing on the scale.

1) Set the selector switch to appropriate range. When current is unknown use the highest current range.
2) Plug Black test lead into the "-" jack.
3) Plug Red test lead into the "+" jack.
4) Using the Red and Black test leads connnect the meter in series with the circuit under test.
5) If meter deflects to the left, reverse the Red and Black test prods.

6) If meter indication is in lower half of scale and falls within the range of a lower scale, reset selector switch to the lower range.

7) Range	Read On Scale	Multiply (x) Or Divide (÷) Reading By
0-10uA*	0-30	÷3
0-15uA	0-15	x1
0-150uA	0-15	x10
0-1.5mA	0-15	÷10
0-150mA	0-15	x10

*This range is achieved by setting the range selector switch to 0-750mV range, taking readings on 0-30 scale and dividing by 3.

AC Current Measurement

AC Current can be measured using a clamp-on current transducer available separately as an accessory. All AC current measurements are read on the 5/10/25 AC Amps scale and an appropriate multiplying or dividing factor applied (See paragraphs 5 and 6 below) when the range selector switch on current transducer is set on a range other than those appearing on the scale or when a range-extending accessory (A45-L, A45-CL, A50-1, CT-50) is also used.

1) Set the selector switch to AC A position.
2) Plug current transducer into AC AMPS jack.
3) Set range selector switch in base of current transducer to desired range. If current is unknown use the highest current range.
4) If meter indication is in lower half of scale and falls within the range of a lower scale, reset range selector switch to the lower range.
5) Model A603 or A653 Current Transducer Ranges

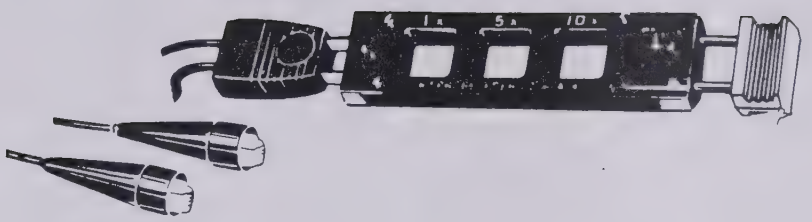
AC Amps Range	Read on Scale	Multiply (x) Reading By
0-5	0-5	x1
0-25	0-25	x1
0-100	0-10	x10
0-250	0-25	x10

a) The Energizer A45-L or A45-CL can extend the current measuring sensitivity of the A603/A653 transducers as follows:

A603/A653 Range Switch Position	Use Energizer Loop	Read On Scale	Multiply (x) Or Divide (÷) Reading By	Effective Range
0-5	10x	0-5	÷10	0-0.5
0-5	5x	0-10	÷10	0-1.0
0-25	10x	0-25	÷10	0-2.5
0-100	10x	0-10	x1	0-10*

*The Energizer A45-L/A45-CL has a maximum rating of 10 amperes.

A45-L



b) The Deca-Tran A50-1 can extend the current measuring capability of the A603/A653 transducers as follows:

A603/A653 Range Switch Position	Read on Scale	Multiply (x) Reading By	Effective Range
0-5	0-5	x10	0-50
0-100	0-10	x10	0-1000*
0-250	0-25	x10	0-1200*

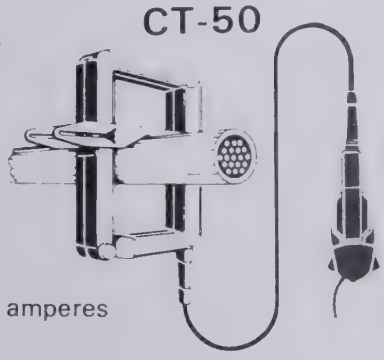
*The Deca-Tran A50-1 has a maximum rating of 1200 amperes intermittent duty, 600 amperes continuous duty.

A50-1

c) The Amptran CT-50 can extend the current measuring capability of the A603/A653 transducers as follows:

A603/A653 Range Switch Position	Read On Scale	Multiply (x) Reading By	Effective Range
0-25	0-25	x50	0-1250
0-100	0-10	x500	0-5000
0-250	0-25	x500	0-6000*

CT-50



*The Amptran CT-50 has a maximum rating of 6000 amperes intermittent duty, 5000 amperes continuous duty.

6) Model A703 or A753 Current Transducer Ranges

AC Ampere Range	Read on Scale	Multiply (x) Reading By
0-10	0-10	x1
0-50	0-5	x10
0-250	0-25	x10
0-500	0-5	x100

a) The Energizer A45-L or A45-CL can extend the current measuring sensitivity of the A703/A753 transducers as follows:

A703/A753 Range Switch Position	Use Energizer Loop	Read On Scale	Multiply (x) or Divide (÷) Reading By	AC Amp Effective Range
0-10	10x	0-10	÷10	0-1
0-10	5x	0-10	÷5	0-2
0-50	10x	0-5	x1	0-5*

*The Energizer A45-L/A45-CL has a maximum rating of 10 amperes.

b) The Deca-Tran A50-1 can extend the current measuring capability of the A703/A753 transducers as follows:

A703/A753 Range Switch Position	Read On Scale	Multiply (x) Reading By	AC Amp Effective Range
0-10	0-10	x10	0-100
0-250	0-25	x100	0-1200*

*The Deca-Tran A50-1 has a maximum rating of 1200 amperes intermittent duty, 600 amperes continuous duty.

c) The Amptran CT-50 can extend the current measuring capability of the A703/A753 transducers as follows:

A703/A753 Range Switch Position	Read On Scale	Multiply (x) Reading By	AC Amp Effective Range
0-50	0-25	x100	0-2500
0-250	0-25	x500	0-6000*

*The Amptran CT-50 has a maximum rating of 6000 amperes intermittent duty, 5000 amperes continuous duty.

RESISTANCE MEASUREMENTS

All resistance measurement readings are taken on the OHMS scale

The ohmmeter portion of the meter is powered by two 1.5V type "C" batteries. To install the batteries, remove the back cover by loosening 3 screws. Remove batteries using plastic pull loops. Remove plastic pull loops from old batteries and place them on new batteries. Insert the new batteries observing proper polairty. Replace cover.

1) Set the selector switch to appropriate range.
2) Plug the Black test lead into the "-" jack.
3) Plug the Red test lead into the "+" jack.
4) Short the test leads by touching them together.
5) With leads shorted together observe pointer. It should read "0" at the right hand end of the OHMS scale.
6) If pointer does not indicate "0", use ohmmeter zero adjust knob to line up with "0" on OHMS scale. If pointer cannot be brought up to "0", replace batteries.
7) Separate the test leads.
8) Connect test leads across the resistance to be measured. Caution: Resistance to be measured must be disconnected from all power before applying ohmmeter test leads.
9) Take reading on OHMS scale and multiply reading by the multiplication factor indicated by the selector switch RX1, RX10, RX100 or RX10K.
10) If there is little or no pointer deflection from "infinity" (∞ lefthand end of scale), reset selector switch to a higher range in an effort to get a greater deflection. The best readability on an ohmmeter range is between midscale and zero ohms. Note: When switching ranges, readjust pointer to "0" ohms as outlined above. When resistance is unknown, start with the highest resistance range (RX10K).

Temperature Measurements

A. Temperatures of -10°F to +250°F may be measured directly with the Model AM-3 by using a temperature probe (Cat. No. RBT-11, RBT-12 or RBT-13*) which is available separately as an accessory item. *RBT-13 Probe should not be used in temperatures above 150°F as probe housing cannot withstand higher temperatures.
   1) Set range switch to RX100 range (LoTemp)
   2) Insert probe plug into "TEMP Lo" jack.
   3) Insert voltage test leads into the "-" and "+" jacks.
   4) Short the test leads by touching the tips together.
   5) With leads shorted together observe pointer. It should indicate "0" at the right hand end of the OHMS scale.
   6) If pointer does not indicate "0", use ohmmeter zero adjust knob to line up pointer with "0" on OHMS scale. If pointer cannot be brought up to "0", replace batteries.
   7) Remove voltage test leads.
   8) Place temperature probe tip in area where a temperature is to be measured.
   9) Read temperature on black temperature scale (-10°F to +250°F) after meter indication appears to be stabilized.

B. Temperatures of +70°F to +1200°F may be measured directly with the Model AM-3 by using Thermocouple, Cat. No. TC-3 which is available separately as an accessory item.
   1) Set range switch to 75DC mV range (Hi Temp) position.

2) Before plugging in thermocouple; adjust meter pointer to room temperature on the temperature scale. This is done by means of the "Zero" adjust screw.
3) Insert thermocouple plug into "Hi Temp" jack.
4) Place metal ferrule of the thermocouple lead in area where temperature is to be measured. Use accessory clip adaptor TC-C (not furnished) to fix location of thermocouple, if necessary.
5) Read temperature on black temperature scale (+70°F to +1200°F) after meter indictation appears to be stabilized.

Circuit Protection

All ranges are fuse-protected or can withstand application of 220 Volts for ½ minute.
The 8AG-361 1 ampere fuse protects the RX1 Ohmmeter and 150mA DC ranges.
The 3AG-312 1/10 ampere fuse protects the RX10, RX100 Ohmmeter, 1.5mA DC, 150uA DC and 75mV DC ranges.
All other ranges can sustain 220 Volts for a period of ½ minute.

To avoid loss of the use of your instrument because of a blown fuse, at least one replacement fuse of each type should always be kept with the instrument.

As an extra protection feature, if either of the two fuses are blown, only the Amps AC and two temperature ranges remain functional. The blown fuse must be replaced before all the other ranges become functional.

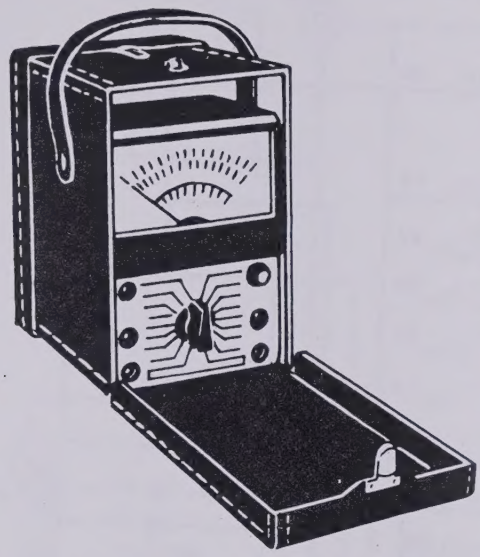
Fuse Replacement

If the meter fails to function on any range (except Amps AC and two temperature ranges) proceed as follows:

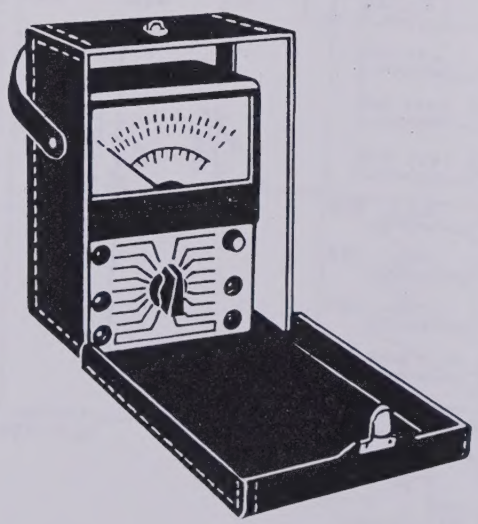
1) If you have a Lo temperature probe (RBT-11, RBT-12, RBT-13)
   a) Set range selector switch to Lo Temp position.
   b) Insert temperature probe in Lo Temp jack.
   c) If pointer moves up scale, batteries have sufficient power to move pointer when range switch is set in RX1 position.
   d) Set range selector switch for RX1 position.
   e) Insert test leads in "-" and "+" jacks.
   f) Short test leads by touching them together.
   g) With leads shorted together, observe pointer.
      If pointer moves upscale, both fuses are good and the cause of the problem is elsewhere. If pointer does not move, replace fuses as explained in following section.

2) If you do not have a Lo Temperature probe, replace fuses as follows:
   a) Remove 3 screws from back of the instrument.
   b) The back case of the instrument can now be removed, exposing the printed circuit board with the two fuses mounted in fuseholders.
   c) Remove both fuses and replace with new fuses.
   d) Replace back case and screws.
   e) If instrument still does not function on the desired range, the problem is elsewhere.
   f) If instrument functions, set it up as an ohmmeter on the RX10 range.
   g) Use instrument to test fuses that were just removed from instrument. Keep any fuse that tests out as follows: 1 ampere fuse (Littelfuse 8AG-361) resistance less than two ohms (one division on RX10 range). 1/10 ampere fuse (Littelfuse 3AG-312) resistance less than four ohms (two divisions on RX10 range).

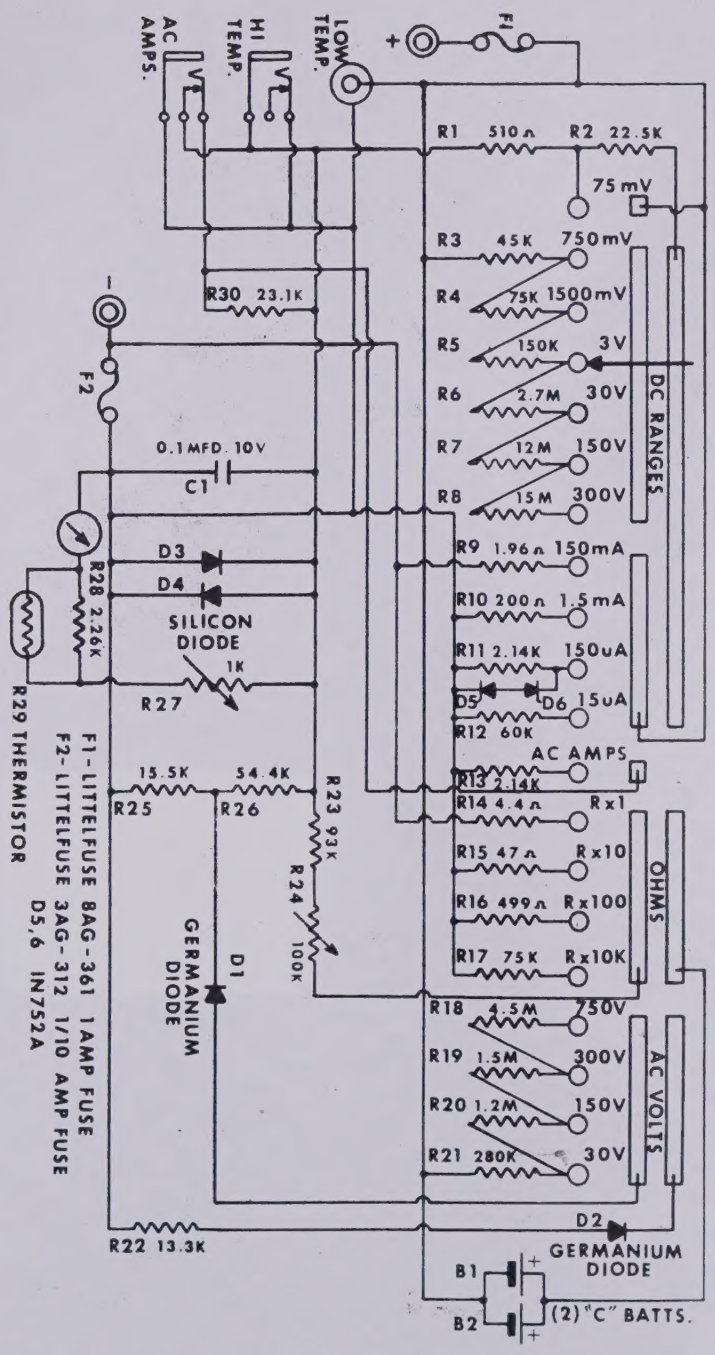
Model MM-4 Carrying Case
Ever-ready case permits use of instrument while in the case for extra protection. Separate storage compartment can accommodate test leads, two temperature probes, and two current transducers.



Model MM-3 Carrying Case
Provides storage for instrument and one or two accessories.



Circuit Diagram



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